

1 **OUTSIDE-HINGED COVER FOR PROTECTING ARTICLES STORED**
2 **THEREIN AND METHOD FOR FABRICATING SAME**
3

4 **BACKGROUND OF THE INVENTION**

5 **1. Field of the invention**

6 The present invention relates, generally, to protective covers for housing various
7 items, and more particularly, to a book-like outside-hinged cover for packaging, housing
8 and protecting items such as stamp collections, photographs, compact discs, cassettes,
9 and other electronic storage media.

10
11 **2. Description of Related Art**

12 With reference now to Figure 1A, an exemplary typical hardcover book 10 known
13 in the art comprises a plurality of pages 12 and a cover 14 (referred to as the book's
14 "case" in the bookbinding arts) having two panels 15, 16, a spine 17, and two hinges 18,
15 19, with one hinge 18, 19 on either side of the spine 17. The plurality of pages 12 forms
16 a support structure for the panels 15, 16 of the cover 14, keeping the spine 17 at
17 substantially a right angle with respect to the panels 15, 16. As illustrated in Figure 1B, if
18 all the pages 12 are removed from the book 10' and the book 10' is shut, the spine 17 will
19 collapse. This occurs because, as one hinge 19 opens, the spine 17 approximates one
20 panel 15 of the cover 14 as the angle between the two at the hinge 19 decreases, and as
21 the other hinge 18 closes, the spine 17 moves away from the other panel 16 of the cover
22 14 as the angle between the two at the hinge 18 increases. The thickness of the book 10'
23 that remains (i.e., only the cover 14) will equal approximately the combined thickness of
24 one cover panel 15 and the other cover panel 16.

1 Illustrated another way, Figure 1C shows a typical hardbound book 70, which
2 comprising a cover 76 having a front panel portion 71, a rear panel portion 72, and a
3 spine portion 73, and is hinged on the inside of the spine 73. In this inside-hinge
4 configuration, the front 71 and rear 72 panels both rotate about the spine panel 73 by
5 means of hinges 78, 79 formed in a pliable material between the front 71 and rear 72
6 panels and the spine panel 73, wherein the axes of rotation are located toward the inside
7 of the book 70, away from the spine panel 74. This inside-hinge configuration limits the
8 inward rotational travel of the front 71 and rear 72 panels toward one another solely
9 based on the thickness of the plurality of pages contained within the cover 76. If the
10 plurality of pages is not attached, either directly or indirectly, to the spine 73, then
11 appropriate support for the front 71 and rear 72 panels may not be provided when the
12 panels 71, 72 are shut.

13 Thus, in order for a typical hardcover book to maintain its rigidity while shut, the
14 following two requirements must be met: (1) the width (thickness) of the spine must be
15 approximately equal to the combined thickness of the front panel, the contents, and the
16 back panel; and (2) the inside of the spine must be attached at nearly all points along its
17 length to the contents of the cover.

18 Numerous situations exist in which the foregoing two conditions cannot be met,
19 e.g., a photo album or stamp album that is not completely filled with pages, or a book
20 holding compact discs (CDs), cassettes, diskettes, or other data storage or recording
21 media. Prior art solutions to the problem of the collapsing spine include three-ring
22 binders, certain photo albums, and holders for storing CDs. The three-ring binder or
23 notebook maintains a rigid spine because of the rigidity of the metal rings, which also

1 serve to retain the pages. Some photo albums have screws for retaining the pages, which
2 also aid in maintaining the spine's rigidity.

3 Known solutions to the problem of the collapsing spine, e.g., the common CD
4 packages known as "jewel boxes", introduce other deficiencies, some of which exist
5 partly because the universal standard width of a CD package is 5/16", despite the fact that
6 the combined thickness of a CD and the printed material accompanying the CD is usually
7 less than 1/8". Made of plastic, the jewel box is easily cracked, the hinge is easily broken,
8 the front panel is hard to open, the booklet is difficult to remove and to replace, the
9 general look is ordinary and mass-produced, and the excessive amount of plastic
10 contributes to the problem of pollution. An exemplary alternative to the jewel box might
11 be a hardcover booklet, wherein the combined thickness of the front panel, the boss that
12 holds the CD onto the inside of one panel, the booklet glued onto the other panel, and the
13 back panel, equals 5/16". However, since the inside of the spine cannot feasibly be
14 attached at all points to the contents of the booklet, the spine still collapses.

16 SUMMARY OF THE INVENTION

17 The present invention provides an outside-hinged cover that will maintain rigidity
18 when shut, even if (1) the width (thickness) of the spine is not approximately equal to the
19 combined thickness of the front panel, the contents, and the back panel; and/or (2) the
20 inside of the spine is not attached at nearly all points along its length to the contents of
21 the book. A cover constructed in a manner consistent with this invention prevents the
22 spine from collapsing, even if there are no contents between the two panels.

Figure 2 illustrates an exemplary book-like object 80 comprising an exemplary outside-hinged cover 86 consistent with the invention. The cover 86 has a front panel portion 82, a rear panel portion 83, and a spine portion 81, and is hinged on the outside of the spine 81. In this outside-hinge configuration, the front 82 and rear 83 panels both rotate about the spine panel 81 by means of hinges 88, 89 formed in a pliable material between the front 82 and rear 83 panels and the spine panel 81, wherein the axes of rotation are located on the outside of the book-like object 80, at or adjacent the spine panel 81. As described in further detail hereinbelow, this outside-hinge configuration limits the inward rotational travel of the front 82 and rear 83 panels toward one another based, not on the thickness of the plurality of pages contained within the cover 86, but instead, based on the configuration of the front 82 and rear 83 panels with respect to the spine panel 81, wherein the spine panel 81 serves as a hinge stop for the front 82 and rear 83 panels. Regardless of whether or not a plurality of pages (or other contents) is attached to the spine 81 of the cover 86, appropriate support for the front 82 and rear 83 panels is provided when the panels 82, 83 are shut.

The invention may have utility in books, book-like objects, covers, cases, holders, packages, or other protective or storage devices. A hinged cover consistent with the invention may be constructed with particular sensitivity to the environment, as the materials thereof may comprise organic materials such as cloth, cardboard and paper (instead of, e.g., plastic). Since most or all of the parts may be formed from rectangular pieces, there will be almost no wasted materials when parts are cut. A hinged cover consistent with the present invention may have particular utility as a CD holder that resembles a hardbound book, and may also take the form of a book-like object for storing

other recorded or stored material or data, so that such packaging can be sturdier, more attractive, easier to open, and less environmentally detrimental than standard designs.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1A is a side perspective view of an exemplary hardbound book known in the art;

Figure 1B is a side perspective view of an exemplary hardbound book known in the art, with its pages removed;

Figure 1C is a side perspective view of another exemplary hardbound book known in the art;

Figure 2 is a side perspective view of an exemplary book-like object comprising an exemplary hinged cover consistent with the present invention;

Figure 3 is a top perspective view of an exemplary hinged cover consistent with the invention in its initial phase of construction, wherein the panel cores are placed on the cover prior to being affixed thereto;

Figure 4 is a top perspective view of an exemplary hinged cover consistent with the invention wherein the overhanging flaps of the cover are folded over and glued onto the panel cores;

Figure 5 is a top perspective view of an exemplary hinged cover consistent with the invention wherein the inside liner sheet is placed and glued on;

Figure 6 is a top perspective view of an exemplary hinged cover consistent with the invention wherein the panels are raised slightly and moved towards the spine;

Figure 7 is a side perspective view of an exemplary hinged cover consistent with the invention wherein the two panels are rotated to a vertical position;

Figure 8a is a cutaway view of the exemplary hinged cover illustrated in Figure 7, at the cross-section of plane II-II;

Figure 8b is a cutaway view of the exemplary hinged cover illustrated in Figure 7, at the cross-section of plane III-III;

Figure 9 is a top perspective view of another exemplary hinged cover consistent with the invention in its initial phase of construction;

Figure 10a is a side cutaway view of the fully assembled exemplary hinged cover illustrated in Figure 9;

Figure 10b is a side cutaway view of an exemplary hinged cover consistent with the invention in its initial phase of construction, wherein a unitary panel core is utilized, wherein the inside edges of the panels and both edges of the spine are cut at 45 degree angles;

Figure 10c is another side cutaway view of an exemplary hinged cover consistent with the invention in its initial phase of construction, wherein a unitary panel core is utilized, wherein the inside edges of the panels and both edges of the spine are cut at 45 degree angles;

Figure 10d is a top perspective view of an exemplary hinged cover consistent with the invention in its initial phase of construction, wherein a unitary panel core is utilized, wherein the inside edges of the panels and both edges of the spine are cut at 45 degree angles;

1 Figure 10e is a side cutaway view of an exemplary hinged cover consistent with
2 the invention, wherein the inside edges of the panels and both edges of the spine are cut
3 at 45 degree angles, with the cover and paper liner glued in place onto the panel core unit;

4 Figure 10f is a side cutaway view of another exemplary hinged cover consistent
5 with the invention, wherein the two panels are rotated to a vertical position, and wherein
6 the inside edges of the panels and both edges of the spine are cut at 45 degree angles;

7 Figure 10g is an exploded side view of an exemplary hinged cover consistent with
8 the invention, wherein the panels and spine are separate pieces attached to a sheet of
9 flexible material, and wherein the inside edges of the panels and both edges of the spine
10 are cut at 45 degree angles;

11 Figure 11 is an elevated perspective view of an exemplary CD holder consistent
12 with the invention;

13 Figure 12 is a side perspective view of an exemplary CD boss used in an
14 exemplary CD holder consistent with the invention;

15 Figure 13 is a top perspective view of an exemplary CD boss used in an
16 exemplary CD holder consistent with the invention; and

17 Figure 14 is a side perspective view of the exemplary CD holder of Figure 11,
18 with a CD being held in place.

20 DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

21 Turning now to Figure 3, an exemplary packaging hinged cover (or "book") 20
22 consistent with the invention in its initial phase of construction is illustrated. First, the
23 cover 25 is laid out flat, and if the outside of the hinged cover is to be printed, then the

1 printed side faces down. Next, glue (not shown) is spread onto the exposed side of the
2 cover 25. As shown, three panel cores – a front 21, spine 22, and rear 23 panel core – are
3 placed on the cover 25 prior to being affixed thereto. Resultant overhanging flaps 26
4 extend beyond the panel cores 21-23, each flap 26 in this exemplary embodiment having
5 an isosceles trapezoidal form (although it should be noted that the flaps 26 could
6 alternatively be convex hexagonal or rectangular forms to accommodate the thickness of
7 the panels, or other geometric forms). The front 21 and rear 23 panel cores have the
8 same length, width (thickness), and height, and the spine panel core 22 has the same
9 width as the front 21 and rear 23 panel cores, although it is not necessary that the cores
10 21-23 are sized in this relationship to one another (e.g., the spine panel core 22 could be
11 thicker than the other cores 21-23). The front 21 and rear 23 panel cores and spine panel
12 core 22 are laid onto the cover 25, such that the width of the space between the spine
13 panel core 22 and each of the other panel cores 21, 23 is approximately equal to the sum
14 of the width (thickness) of the spine panel core 22, twice the width (thickness) of the
15 cover 25, and twice the width (thickness) of the liner sheet 28 (see Figure 5) to be affixed
16 in a subsequent step. Further, those skilled in the art will recognize that other adhesive
17 materials and/or methods of affixation may be used to join the panel cores 21-23 and the
18 cover 25 instead of glue, e.g., stitching, stapling, etc. Alternatively, the panel cores 21-23
19 and the cover 25 may be fabricated from a single sheet, such as cardboard, or glued
20 together in alternative configurations, as described hereinbelow and illustrated in Figures
21 9 and 10a.

22 With reference now to Figure 4, the overhanging flaps 26 of the cover 25 are
23 folded inward, over the edges of the panel cores 21-23 and then glued (or otherwise

affixed, as described hereinabove) onto the exposed outer edges and/or upper surfaces of the panel cores 21-23.

Next, as illustrated in Figure 5, the inside liner sheet 28 is placed and glued (or otherwise affixed, as described hereinabove) onto the surface comprising the exposed upper surfaces of the panel cores 21-23 (not shown) and may also overhang a portion of the flaps 26 of the cover 25.

Turning now to Figure 6, at this point in the construction, a front 32 and rear 33 panel and a spine 30 are formed by lifting the outer edges 34, 35 of the hinged cover 20 slightly (as shown, forces F_3) and applying an inward force F_1 , F_2 to each outer edge in the direction of one another, such that the elements (i.e., liner 28 and cover 25) along the hinges 38 are forced together. When forced together, the liner 28 and cover 25 may be glued (or otherwise affixed, as described hereinabove) to one another, if adhesive is deposited therebetween prior to the liner sheet 28 being placed in the previous step.

As Figure 7 illustrates, while the spine 30 remains stationary, the front 32 and rear 33 panels are folded up toward one another to a vertical position along the hinges 38. This further joins the remaining unaffixed parts of the cover 25 and liner sheet 28 to the rest of the unit, i.e., the cover 25 and liner sheet 28 are now fully adhered to the edges of the panel cores 21, 23 and spine core 22. This process is more clearly seen in the cutaway views of Figure 8a (shown at the cross-section of plane II-II of Figure 7) and 8b (shown at the cross-section of plane III-III of Figure 7). As Figure 8a illustrates, the small loose portions of cover 25 and liner sheet 28 created by each of the hinges 38 are pushed outward so that they rest under the now-horizontal edge 39 of the panel 32, 33. As shown, a bond may be formed between the inner section 29 (that was folded inward in

1 a previous step) and outer section 31 of the cover 25, if adhesive is deposited
2 therebetween (or otherwise affixed, as described hereinabove) prior to this step. Further,
3 if adhesive is deposited therebetween (or otherwise affixed, as described hereinabove), a
4 bond may be formed between each side 37 of the spine 30 and the portions 36 of the
5 cover 25 that now abut it. The space under each panel core 21, 23 is now completely
6 filled in with two layers of cover 25 material and two layers of inside liner 28 material.
7 Because of the strength of the cover 25 material on the outside of the unit 20, this space
8 cannot expand.

9 Figure 8b illustrates that, unless the overhanging flaps 26 (see Figure 4) are large
10 enough to cover the entire underside of the panel cores 21-23, there will be an area where
11 there is no inner section 29 of the cover 25, i.e., at a cross-section taken along plane III-
12 III, there may be a portion of the length of the spine 30 for which no cover material 25
13 extends along the inside of the hinge, depending on the dimensions of the cover material
14 25 used.

15 At this point, the construction is complete, and the outer sections 31 of the cover
16 25 are now taut, and the spine 30 is located such that it stops panels 32, 33 from closing
17 substantially beyond 90 degrees relative to the horizontal surface of the spine 30, even if
18 (1) the width (thickness) of the spine 30 is not approximately equal to the combined
19 thickness of the front panel 32, the contents (not shown), and the back panel 33; and/or
20 (2) the inside of the spine 30 is not attached at nearly all points along its length to
21 whatever the contents of the hinged cover 20 might be.

22 The cover 25 may be constructed from flexible but strong materials, including
23 cloth, paper, paperboard, or other pulped, fibrous and/or sturdy materials, or

combinations thereof, including those derived from wood, cotton, linen, bamboo, hemp, rice straw, or polymer-derived materials. Adhesives used may include water-based glues, animal product-derived glues (including, e.g., albumen, fish and rabbit), vegetable-derived glues (including, e.g., agar-agar, arrowroot, rice starch, and potato starch), polymer-based and hot-melt glues. Non-adhesive attachment methods may include sewing, stapling, stitching, staple-like joining devices, or other mechanical adhesion means. The front, spine, and rear panel cores may be constructed from cardboard, paperboard, wood, polymer-derived materials, or other rigid, sturdy materials.

As Figure 9 and 10a illustrate, in some cases, e.g., when using a cover material that is not sturdy, it may be desirable to employ a unit 40' comprising panel cores 41'-43' that are pre-glued onto a sheet 45' (which corresponds to the cover 25 in the previously described embodiments) comprising sturdy but flexible material. Alternatively, as Figures 10b-10g illustrate, a unitary component 40' may be used, wherein a thick, sturdy material such as cardboard or plastic is used, and wherein the panel cores 41'-43' are formed by excising two portions 47', 48' in the unitary component 40', such that only a "sheet" portion remains in those excised locations 47', 48'. (Figure 10c is a closer view of the unitary component 40' of Figure 10b, and Figure 10d is a top perspective view of the same unitary component 40'.) Figure 10e is a side cutaway view of an exemplary hinged cover 40' consistent with the invention, wherein the cover 45' and paper liner 28' are glued in place onto the unitary panel 40'.

The unitary component 40' or other such unit 40 may further comprise overhanging flaps (not shown), as in the previously described embodiments, which may

be formed by excising material, or by gluing onto panel cores 41-43 (or 41'-43') a sheet 45 (or 45') having overhanging portions.

In another embodiment 40'', as shown in Figures 10f (a side cutaway view) and 10g (an exploded side view), the edges of the spine 42'' and core panels 41'', 43'' may be cut or otherwise formed to meet at an angle other than 90 degrees, so long as the spine 42'' and core panels 41'', 43'' meet at any predetermined angle, based on the spine 42'' serving as a hinge stop for each panel 41'', 43''. Thus, each panel 41', 43'', when rotated toward the other panel 41'', 43'', is constrained from rotating substantially beyond a certain angle with respect to the spine 42'' (as illustrated in Figure 10f). Such a construction may comprise three separate parts 41''-43'' glued to a sheet 45'' of paper/plastic or other material, or may comprise a unitary panel, as described hereinabove. Additionally, a cover 45'' and/or paper liner 28'' may be disposed as described above.

As shown in Figures 10b-10g, the inside edges of the panels and both edges of the spine are cut at 45 degree angles; the remaining figures herein show the angle of the inside edge of the panel to be 0 degrees, while the angle of the outside edge of the spine to be 90 degrees. These configurations are but exemplary of the invention, and other angular configurations are possible. For example, (as seen in Figure 10f) in order for the panel cores 41', 43' to remain at right angles with respect to the spine core 42' when the unit is in a closed position, the sum of the angle 99 of an inside edge of a panel 41', 43' (here, 45 degrees) and the angle 98 of an outside edge of the spine 42' to which it interfaces (here, 45 degrees), with both angles measured relative to the sheet 45', is 90 degrees. Of course, the angles could be 30 degrees/60 degrees, 45 degrees /45 degrees, 0

degrees/90 degrees (as illustrated in and described above with respect to Figures 3 through 10a), or any other combination of angles whose sum is 90 degrees, in order for the spine core 42'' to stop the travel of either panel 41', 43' at 90 degrees. In some embodiments, certain uses of the present invention may dictate that the panels 41', 43' stop rotational travel at a number of degrees greater than or less than 90.

As illustrated in Figures 11 through 14, a hinged cover consistent with the invention may also serve as a holder or package for storing CDs and accompanying printed matter. Turning now to Figure 11, an exemplary CD holder 50 is shown, comprising an exemplary hinged cover 20 or 40 as described hereinabove, with a front panel 51, spine 52, and rear panel 53, a boss 55 for retaining a CD, and a booklet 54 comprising a plurality of pages. (For ease of viewing, not all components of the cover 20 or 40 are shown in Figure 11, as they have already been described hereinabove with reference to Figures 3 through 10). The booklet 54 may be glued or otherwise affixed to the inside of the rear panel 53 (e.g., to the liner 58), and the CD boss 55 may be glued onto the inside of the front panel 51 (e.g., to the liner 58), or alternatively, a unitary liner 58 (e.g., manufactured from a polymer-based or other moldable material) may comprise an integrated CD boss 55.

As illustrated in Figures 12 and 13, an exemplary CD boss 55 is a unitary element and comprises a lower circular member 61 and an upper circular member 62. The lower circular member has a diameter greater than that of the center hole of a standard CD (e.g., 45 mm). The upper circular member is tapered, such that its upper surface 63 has a diameter slightly greater than that of a standard CD (e.g. 15.3 mm), and the lower portion 64 has a diameter approximately equal to or slightly less than that of a standard CD (e.g.

1 14.8 mm). For this exemplary CD boss 55, the lower circular member 61 has a thickness
2 of 1.3 mm, and the upper circular member 62 has a thickness of 2 mm.

3 With reference now to Figure 14, a side perspective view of the exemplary CD
4 holder 50 of Figure 11 is shown, with a CD 59 being held in place. The CD 59 is held in
5 place by a boss 55 attached to the rear panel 53. A booklet 54 comprising a plurality of
6 pages is attached to the front panel 51. Since the front 51 and rear 53 panels and the
7 spine 52 are rigid, and since the front 51 and rear 53 panels cannot close substantially
8 beyond 90 degrees relative to the horizontal surface of the spine 52, the CD holder 50
9 when closed (i.e., the front 51 and rear 53 panels brought together) maintains an
10 aesthetically pleasing appearance where all angles are essentially 90 degrees. Because of
11 the rigidity of these 90-degree angles, the CD holder maintains its pleasing appearance
12 even when squeezed in among other books in a bookshelf -- the spine does not collapse,
13 and the title may be read with ease. It should be understood that, when the cover is
14 "closed" (i.e., the front 51 and rear 53 panels are brought together), the boss 55 may
15 contact the booklet 54 (or inside of the front panel 51, in an embodiment having no
16 booklet), and/or the outer edges 67, 68 of the front 51 and rear 53 panels may contact one
17 another. Of course, attachment means other than a boss 55 may be used to hold a CD (or
18 other contents) in place, e.g., a pocket, retaining clip or lip, etc. It should further be
19 recognized that a plurality of CDs may also be held in place inside a single cover,
20 whether arranged horizontally, vertically, in rows, or otherwise on the inside of one
21 panel, or even on top of one another (i.e., one CD held to the inside of the front panel,
22 and the other held to the inside of the rear panel). This embodiment may be suitable for a
23 wide range of uses for CDs, CD-ROMs, DVDs, diskettes, and other media, which may

1 contain music, video, pictures, software or other data stored thereon. For example, one
2 specific use would be a “mini-photo album” for a CD-ROM containing photographs,
3 wherein an included booklet contains printed versions of some or all of the photographs
4 stored on the disc, and a cloth cover provides an attractive miniature album-type device
5 for housing the printed photographs and the CD-ROM. It should also be noted that other
6 embodiments of the present invention may include additional features, e.g., flaps or
7 panels at the top and/or bottom of the device and/or side (e.g., as seen in Figure 2) to
8 prevent dust or other matter from entering between the cover panels when the device is
9 stored on its end (e.g., on a bookshelf with the spine facing outward, as an ordinary
10 hardcover book would be stored).

11 The embodiments that have been described herein, however, are but some of the
12 several which utilize this invention and are set forth here by way of illustration but not of
13 limitation. It is obvious that many other embodiments, which will be readily apparent to
14 those skilled in the art, may be made without departing materially from the spirit and
15 scope of the invention.

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17 What is claimed is:
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